REMARKS

The missing designation "t" has been inserted where it was missing in independent claims 1 and 3. In addition, a capitalization error in these claims has been corrected. In light of these corrections, it is respectfully submitted that the objection to the claims can now be withdrawn.

The claims pending in this application were rejected under 35 U.S.C. 103 over Ando in view of "applicants admission". The rejection is respectfully traversed.

The Ando reference has been acknowledged not to show either the same materials as set forth in the instant claims or the dimensional relationship specified in those claims. In order to overcome these deficiencies, the Office Action takes official notice that bismuth-based ceramics are recognized equivalents of PZT and asserts that the ratio nL/t was well known in the art to be a result effective variable. The "Official Notice" thus takes a very broad view and assumes that all piezoelectric materials are equivalent for all purposes and in all manner. This, in fact, is not true. For instance, bismuth-based ceramic are clearly different from conventional piezoelectric materials such as Ando's PZT from the point of crystal structure and piezoelectric properties. There is no relationship between bismuth-based ceramics and PZT ceramics as to electrode diameter, electrode area, and distance between the electrodes with respect to optimum harmonic overtone. In other words, a geometric relationship between the two types of piezoelectric materials as to these factors does not exist. This point is made in the very paragraph on which the Examiner has relied with respect to the so-called "admission".

The Office has asserted that the applicant has admitted it is well known in the art that the ratio nL/t is a result effective variable. The Office Action states on page 3 that this admission is found in the first full paragraph on page 2 of the application. A review of that paragraph shows that the assertion is not valid.

The first full paragraph on page 2 is as follows:

> However, the energy-confinement elements exciting thickness vibration harmonic waves have different optimized electrode structures depending on the piezoelectric material being used, with a result that the optimum geometry of the piezoelectric element must be determined as a function of the material being used.

What this paragraph thus admits that is the optimum geometry of the piezoelectric element is a function of the material being used. It does not refer to any particular aspects of the geometry.

The word "geometry" generally refers to numerous aspects of a piezoelectric construct. It can refer to the total surface area of the element, the surface area of the principle planes of the element, the length-to-width ratio of the principal planes , the length-to-width ratio of planes other than the principal planes, the number of vibratory electrodes, the distance that an electrode is from a given surface, the thickness of the electrode, the area of the electrode, the shape of the electrode, as well as a host of other physical permutations and combinations. A generic reference to "geometry" as found in the present application does not constitute an admission that one skilled in the art needs to look at one or more of the possible geometric dimensions or to look at certain relationships between those dimensions.

The Office Action observes that a relationship is notoriously known in which the energy stored in a parallel plate capacitor is directly proportional to the area of the adjacent electrodes multiplied by the distance between the adjacent electrodes. It is respectfully submitted that such a known relationship is not helpful in the present application because L does not represent the area of an electrode and t is not the distance between adjacent electrodes. Moreover, L in the formula is not multiplied by t, rather is divided by it. Still further, the formula in the instant claims is not limited simply to the "geometry" but is a function of the n-order longitudinal thickness vibration.

What the applicant has admitted is that the optimum "geometry" is a function of the material being used. In order to use this teaching in the context of the Ando reference, one skilled in the art would first have to figure out which of the numerous "geography" elements were significant, how the relationship between the significant geometric elements selected was relevant and even if this was done, recognize that the n-order longitudinal thickness vibration is a relevant consideration in identifying which geometric elements should be selected and how they should be compared. It is respectfully submitted that the 1st full paragraph on page 2 of the application is nothing more than a statement that one skilled in the art would recognize that the geometry which is optimum for one piece of electric material is not necessarily optimum for a different piece of electric material. There is, however, no teaching or suggestion of how to consider the various geometric possibilities when the piezoelectric electric material is a bismuth-based ceramic composition.

It is respectfully submitted that while the "admission" is a statement of a known fact, it is in the context of the present invention simply an invitation to those skilled in the art to try to figure out what geometry would be appropriate. What in this "admission" tells the artisan to consider the maximum length of a secant between two intersections on the periphery of the energy-confining region? What in this "admission" tells those skilled in the art to consider the distance between the topmost vibratory electrode and the bottommost vibratory electrode as opposed to, for instance, the topmost vibratory electrode and the middle vibratory electrode or the middle vibratory electrode and the bottommost vibratory electrode? What in this "admission" tells those skilled in the art to give any consideration to the n-order longitudinal thickness vibration? What in this "admission" tells one skilled in the art to consider the multiplication result of the n-order and the maximum length of the secant? What in this "admission" suggests to the one skilled in the art that the distance between the topmost and bottommost vibratory electrodes should be used to divide some other value? What in this "admission" suggests to one skilled in the art that the value of a particular ratio should be less than 10? The

answer to each of these questions is "nothing". It has thus been established that nothing in this record shows that the 1st full paragraph on page 2 of this specification is anything beyond an invitation to experiment.

While there may be an admission that the optimum energy confinement is a function of "geometry", there is no "admission" or art recognition that the relevant geometry is nL/t when the piezoelectric material is a bismuth-based ceramic. In other words, the applicant has clearly not admitted that nL/t is a result effective variable and the other considerations advanced in the Office Action have likewise not shown that this is recognized to be a result effective variable.

There is no basis for even beginning to argue that one skilled in this art would have even attempted to manipulate the optimum value of the nL/t ratio, much less give any consideration to that ratio. Since the prior art does not teach or suggest the same material or dimensions, it is respectfully submitted that there is insufficient basis for the obviousness rejection and it should be withdrawn.

In light of all of the foregoing considerations, it is respectfully submitted that this application is now in condition to be allowed and the earliest issuance of a Notice of Allowance is respectfully solicited.

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Respectfully submitted,

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